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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/759,959
Filing Date: January 16, 2004
Appellant(s): OSTROMEK ET AL.

Thomas Kelton
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed June 19, 2009 appealing from the Office action mailed April 8, 2009.

(1) Real Party of Interest

A statement identifying by name the real party of interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

EP 1,051,045	Daly	11-2000
5,936,245	Goillot et al.	8-1999
5,528,295	Wagner	6-1996
5,347,378	Handschy et al.	9-1994

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 5, 7, 11, 13, 17 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Daly (European Patent Application Publication EP 1,051,045).

Consider **claim 1**, Daly teaches:

A method for generating an image (paragraphs 0042-0045, figure 8), comprising:

Receiving light associated with a plurality of spectral bands (A scene (i.e, light associated with a plurality of spectral bands, 82, figure 8) is captured via optics (82) and passed to a color filter (84), column 11, lines 26-27.);

Repeating the following for each spectral band associated with the light:

receiving an electrical signal at an electro-optical element (An electro-optical element ("active color filter", 84, figure 8) receives an electric signal from a field control clock (86), column 11, lines 25-35.);

changing an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band (The spectral transmission (i.e, an optical property) of the electro-optical element (84) is changed in response to the signal from the field control clock (86), column 11, lines 25-35. The electro-optical component (84) creates a color component set (i.e, filters for different spectral bands) including B, Y, and R color components, column 11, lines 35-47.); and

transmitting the spectral band to a sensor (See "area sensor", 90, figure 8, column 11, lines 35-37. The filtered scene impinges a monochrome area sensor (90).);

sensing the spectral bands at the sensor (See "area sensor", 90, figure 8, column 11, lines 35-37. The area sensor (90) nominally detects and captures the three color fields (i.e. three spectral bands).);

combining the spectral bands to generate a composite signal (The spectral bands are combined by the field to frame combiner (118), figure 8, column 11, line 57 through column 12, line 1.), wherein combining the spectral bands (i.e. fields) to generate the composite signal (i.e. frame) comprises:

accessing a function of the spectral bands (The spectral bands are passed through filters (106, 108, 110, 112, 114, and 116, figure 8) to produce noise free images (i.e. a function, or noise free version, of the spectral bands is obtained), column 11 lines 49-58. The noise free images (i.e. functions of the original images) are provided to (i.e. accessed by) the field-to-frame combiner (118), column 11, line 57 through column 12, line 5.); and

multiplexing the spectral bands in accordance with the function to combine the spectral bands (Each spectral band is subjected to filtering prior to being input into the field-to-frame combiner (figure 8, column 11, lines 49-57). Because all of the spectral bands are filtered, and the functions of all of the spectral bands are input into the field-to-frame combiner (See figure 8), the field-to-frame combiner accesses a function of the spectral bands, and not just a spectral band. Daly, therefore, teaches accessing a function of the spectral bands (i.e. a noise reduced group of spectral bands) and

multiplexing the spectral bands in accordance with the function (The noise reduced spectral bands are combined in the field-to-frame combiner (118), column 11, line 57 through column 12 line 3. The examiner interprets this combining to be multiplexing, as the data of three separate field images is combined to create a single image frame containing all of said data, an intrinsic function of a field-to-frame combiner.).),

said function causing said spectral bands to be combined using at least one of: adding (Daly teaches that the different spectral bands (i.e. fields) are combined to create a frame in a field to frame combiner (118, figure 8, column 11, line 57 through column 12, line 1). The Examiner interprets this combining to be adding individual fields in order to create a frame. Basically, three fields are added into one frame. Thus, the spectral bands are combined using at least one of: adding. The function causes this by virtue of its input into the field to frame combiner, figure 8.); and

generating an image from the composite signal (A color reproduction processor (120) generates an image based on the composite signal, column 11, line 57 through column 12, line 5, column 8 lines 4-5 and lines 15-17.).

Consider **claim 5**, and as applied to claim 1 above, Daly further teaches:

the sensor (90) is synchronized with the electro-optical element (84), the sensor (90) being operable to sense a spectral band when the spectral band arrives at the sensor from the electro-optical element (The sensor (90) and electro-optical element (84) are synchronized by both being connected to the color field control clock (86). See figure 8, paragraph 0042.).

Consider **claim 7**, Daly teaches:

A system for generating an image (see figure 8, paragraphs 0042-0045), comprising:

a electro-optical element ("active color filter", 84, figure 8) operable to:

receive light associated with a plurality of spectral bands (A scene (i.e, light associated with a plurality of spectral bands, 82, figure 8) is captured via optics (82) and passed to a color filter (84), column 11, lines 26-27.);

repeat the following for each spectral band associated with the light:

receive an electrical signal (An electro-optical element ("active color filter", 84, figure 8) receives an electric signal from a field control clock (86), column 11, lines 25-35.);

change an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band (The spectral transmission (i.e, an optical property) of the electro-optical element (84) is changed in response to the signal from the field control clock (86), column 11, lines 25-35. The electro-optical component (84) creates a color component set (i.e, filters for different spectral bands) including B, Y, and R color components, column 11, lines 35-47.); and

transmit the spectral band to a sensor (See “area sensor”, 90, figure 8, column 11, lines 35-37. The filtered scene impinges a monochrome area sensor (90).);

a sensor coupled to the electro-optical element and operable to sense the spectral bands (See “area sensor”, 90, figure 8, column 11, lines 35-37. The area

sensor (90) nominally detects and captures the three color fields (i.e. three spectral bands).);

an image processing module (field-to-frame combiner, 118) coupled to the sensor and operable to combine the spectral bands to generate a composite signal (The spectral bands are combined by the field to frame combiner (118), figure 8, column 11, line 57 through column 12, line 1.),

wherein the image processing module (118) combines the spectral bands (i.e. fields) to generate the composite signal by:

accessing a function of the spectral bands (The spectral bands are passed through filters (106, 108, 110, 112, 114, and 116, figure 8) to produce noise free images (i.e. a function, or noise free version, of the spectral bands is obtained), column 11 lines 49-58. The noise free images (i.e. functions of the original images) are provided to (i.e. accessed by) the field-to-frame combiner (118), column 11, line 57 through column 12, line 5.); and

multiplexing the spectral bands in accordance with the function to combine the spectral bands (Each spectral band is subjected to filtering prior to being input into the field-to-frame combiner (figure 8, column 11, lines 49-57). Because all of the spectral bands are filtered, and the functions of all of the spectral bands are input into the field-to-frame combiner (See figure 8), the field-to-frame combiner accesses a function of the spectral bands, and not just a spectral band. Daly, therefore, teaches accessing a function of the spectral bands (i.e. a noise reduced group of spectral bands) and multiplexing the spectral bands in accordance with the function (The noise reduced

spectral bands are combined in the field-to-frame combiner (118), column 11, line 57 through column 12 line 3. The examiner interprets this combining to be multiplexing, as the data of three separate field images is combined to create a single image frame containing all of said data, an intrinsic function of a field-to-frame combiner.).),

said function selected from a list consisting of: an adding function (Daly teaches that the different spectral bands (i.e. fields) are combined to create a frame in a field to frame combiner (118, figure 8, column 11, line 57 through column 12, line 1). The Examiner interprets this combining to be adding individual fields in order to create a frame. Basically, three fields are added into one frame. Thus, said function is selected from a list consisting of: an adding function. The function causes this by virtue of its input into the field to frame combiner, figure 8.); and

a display module coupled to the image processing module and operable to generate an image from the composite signal (A color reproduction processor (120) generates an image based on the composite signal, column 11, line 57 through column 12, line 5, column 8 lines 4-5 and lines 15-17.).

Consider **claim 11**, and as applied to claim 7 above, Daly further teaches:

the sensor (90) is synchronized with the electro-optical element (84), the sensor (90) being operable to sense a spectral band when the spectral band arrives at the sensor from the electro-optical element (The sensor (90) and electro-optical element (84) are synchronized by both being connected to the color field control clock (86). See figure 8, paragraph 0042.).

Consider **claim 13**, Daly teaches:

A logic for generating an image (Paragraphs 0042-0045 describe logic for generating an image.), the logic embodied in a medium (The circuit of figure 8 is a medium which embodies the logic of paragraphs 0042-0045.) operable to:

Receive light associated with a plurality of each spectral bands (A scene (i.e, light associated with a plurality of spectral bands, 82, figure 8) is captured via optics (82) and passed to a color filter (84), column 11, lines 26-27.);

Repeat the following for each spectral band associated with the light:

Receive an electrical signal at an electro-optical element (An electro-optical element ("active color filter", 84, figure 8) receives an electric signal from a field control clock (86), column 11, lines 25-35.);

change an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band (The spectral transmission (i.e, an optical property) of the electro-optical element (84) is changed in response to the signal from the field control clock (86), column 11, lines 25-35. The electro-optical component (84) creates a color component set (i.e, filters for different spectral bands) including B, Y, and R color components, column 11, lines 35-47.); and

transmit the spectral band to a sensor (See “area sensor”, 90, figure 8, column 11, lines 35-37. The filtered scene impinges a monochrome area sensor (90).);

sense the spectral bands at the sensor (See "area sensor", 90, figure 8, column 11, lines 35-37. The area sensor (90) nominally detects and captures the three color fields (i.e. three spectral bands).);

combine the spectral bands to generate a composite signal (The spectral bands are combined by the field to frame combiner (118), figure 8, column 11, line 57 through column 12, line 1.) by accessing a function of the spectral bands (The spectral bands are passed through filters (106, 108, 110, 112, 114, and 116, figure 8) to produce noise free images (i.e. a function, or noise free version, of the spectral bands is obtained), column 11 lines 49-58. The noise free images (i.e. functions of the original images) are provided to (i.e. accessed by) the field-to-frame combiner (118), column 11, line 57 through column 12, line 5.); and

multiplexing the spectral bands in accordance with the function to combine the spectral bands (Each spectral band is subjected to filtering prior to being input into the field-to-frame combiner (figure 8, column 11, lines 49-57). Because all of the spectral bands are filtered, and the functions of all of the spectral bands are input into the field-to-frame combiner (See figure 8), the field-to-frame combiner accesses a function of the spectral bands, and not just a spectral band. Daly, therefore, teaches accessing a function of the spectral bands (i.e. a noise reduced group of spectral bands) and multiplexing the spectral bands in accordance with the function (The noise reduced spectral bands are combined in the field-to-frame combiner (118), column 11, line 57 through column 12 line 3. The examiner interprets this combining to be multiplexing, as

the data of three separate field images is combined to create a single image frame containing all of said data, an intrinsic function of a field-to-frame combiner.).),

said function causing said spectral bands to be combined using at least one of: adding (Daly teaches that the different spectral bands (i.e. fields) are combined to create a frame in a field to frame combiner (118, figure 8, column 11, line 57 through column 12, line 1). The Examiner interprets this combining to be adding individual fields in order to create a frame. Basically, three fields are added into one frame. Thus, said function is selected from a list consisting of: an adding function. The function causes this by virtue of its input into the field to frame combiner, figure 8.); and

generate an image from the composite signal (A color reproduction processor (120) generates an image based on the composite signal, column 11, line 57 through column 12, line 5, column 8 lines 4-5 and lines 15-17.),

wherein said medium is selected from the list consisting of: hardware (see figure 8).

Consider **claim 17**, and as applied to claim 13 above, Daly further teaches:

the sensor (90) is synchronized with the electro-optical element (84), the sensor (90) being operable to sense a spectral band when the spectral band arrives at the sensor from the electro-optical element (The sensor (90) and electro-optical element (84) are synchronized by both being connected to the color field control clock (86). See figure 8, paragraph 0042.).

Consider **claim 19**, Daly teaches:

A system for generating an image (see figure 8, paragraphs 0042-0045), comprising:

means for receiving light associated with a plurality of spectral bands (A scene (i.e, light associated with a plurality of spectral bands, 82, figure 8) is captured via optics (82) and passed to a color filter (84), column 11, lines 26-27.);

means for repeating the following for each spectral band associated with the light:

receiving an electrical signal at an electro-optical element (An electro-optical element ("active color filter", 84, figure 8) receives an electric signal from a field control clock (86), column 11, lines 25-35.);

changing an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band (The spectral transmission (i.e, an optical property) of the electro-optical element (84) is changed in response to the signal from the field control clock (86), column 11, lines 25-35. The electro-optical component (84) creates a color component set (i.e, filters for different spectral bands) including B, Y, and R color components, column 11, lines 35-47.); and

transmitting the spectral band to a sensor (See “area sensor”, 90, figure 8, column 11, lines 35-37. The filtered scene impinges a monochrome area sensor (90).);

means for sensing the spectral bands at the sensor (See “area sensor”, 90, figure 8, column 11, lines 35-37. The area sensor (90) nominally detects and captures the three color fields (i.e. three spectral bands).);

means for combining the spectral bands to generate a composite signal (The spectral bands are combined by the field to frame combiner (118), figure 8, column 11, line 57 through column 12, line 1.), wherein the means for combining the spectral bands (i.e. fields) to generate the composite signal (i.e. frame) comprises:

means for accessing a function of the spectral bands (The spectral bands are passed through filters (106, 108, 110, 112, 114, and 116, figure 8) to produce noise free images (i.e. a function, or noise free version, of the spectral bands is obtained), column 11 lines 49-58. The noise free images (i.e. functions of the original images) are provided to (i.e. accessed by) the field-to-frame combiner (118), column 11, line 57 through column 12, line 5.); and

means for multiplexing the spectral bands in accordance with the function to combine the spectral bands(Each spectral band is subjected to filtering prior to being input into the field-to-frame combiner (figure 8, column 11, lines 49-57). Because all of the spectral bands are filtered, and the functions of all of the spectral bands are input into the field-to-frame combiner (See figure 8), the field-to-frame combiner accesses a function of the spectral bands, and not just a spectral band. Daly, therefore, teaches accessing a function of the spectral bands (i.e. a noise reduced group of spectral bands) and multiplexing the spectral bands in accordance with the function (The noise reduced spectral bands are combined in the field-to-frame combiner (118), column 11, line 57 through column 12 line 3. The examiner interprets this combining to be multiplexing, as the data of three separate field images is combined to create a single

image frame containing all of said data, an intrinsic function of a field-to-frame combiner.).),

said function selected from a list consisting of: an adding function (Daly teaches that the different spectral bands (i.e. fields) are combined to create a frame in a field to frame combiner (118, figure 8, column 11, line 57 through column 12, line 1). The Examiner interprets this combining to be adding individual fields in order to create a frame. Basically, three fields are added into one frame. Thus, said function is selected from a list consisting of: an adding function. The function causes this by virtue of its input into the field to frame combiner, figure 8.); and

means for generating an image from the composite signal (A color reproduction processor (120) generates an image based on the composite signal, column 11, line 57 through column 12, line 5, column 8 lines 4-5 and lines 15-17.).

Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daly (European Patent Application Publication EP 1,051,045) in view of Goillot et al. (US 5,936,245), hereinafter referred to as Goillot.

Consider **claim 21**, and as applied to claim 1 above, Daly teaches of capturing a plurality of spectral bands, which spectral bands are part of the visible spectrum (see claim 1 rationale). However, Daly does not explicitly teach that one of said spectral bands is a spectral band of infrared light.

Goillot is similar to Daly in that Goillot teaches of sensing three different spectral bands via sensors, and combining the spectral bands to generate a composite signal by accessing a function of the spectral bands and multiplexing the spectral bands according to the function (See column 4, line 8 through column 6, line 34, figures 1 and 2.).

However, in addition to the teachings of Daly, Goillot teaches that one of said spectral bands is a spectral band of infrared light (column 4, lines 29-31).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention have the plurality of spectral bands taught by Daly comprise at least one spectral band of infrared light as taught by Goillot for the benefit of enabling the detection of higher temperature areas of the image useful in subsequent image analysis (Goillot, column 2, lines 34-41).

Consider **claim 22**, and as applied to claim 7 above, Daly teaches of capturing a plurality of spectral bands, which spectral bands are part of the visible spectrum (see claim 7 rationale). However, Daly does not explicitly teach that one of said spectral bands is a spectral band of infrared light.

Goillot is similar to Daly in that Goillot teaches of sensing three different spectral bands via sensors, and combining the spectral bands to generate a composite signal by accessing a function of the spectral bands and multiplexing the spectral bands according to the function (See column 4, line 8 through column 6, line 34, figures 1 and 2.).

However, in addition to the teachings of Daly, Goillot teaches that one of said spectral bands is a spectral band of infrared light (column 4, lines 29-31).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention have the plurality of spectral bands taught by Daly comprise at least one spectral band of infrared light as taught by Goillot for the benefit of enabling the detection of higher temperature areas of the image useful in subsequent image analysis (Goillot, column 2, lines 34-41).

Claims 2, 3, 8, 9, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daly in view of Wagner (US 5,528,295).

Consider **claim 2**, and as applied to claim 1 above, Daly teaches an electro-optical element for filtering and transmitting different spectral bands (84, figure 8, see claim 1 rationale).

However, Daly does not explicitly teach that the electro-optical element comprises different layers sensitive to different spectral bands.

Wagner is very similar to Daly in that light is passed from a lens assembly (12, figure 1) through an electro-optical filter arrangement (18, figure 1) to an image sensor (28 and 30, figure 1). See column 3, line 31 through column 7, line 4.

However, in addition to the teachings of Daly, Wagner teaches that the electro-optical element (18, figure 1, column 3, lines 32-36) comprises:

a first layer (20, figure 1) sensitive to a first spectral band of the spectral bands (The first layer (20) is tunable to transmit different spectral bands, column 5, line 5 through column 6, line 31. The spectral band transmitted is based on the applied voltage, column 5, lines 64-66. See also figure 2.); and

a second layer (22, figure 1) sensitive to a second spectral band of the spectral bands (The second layer (22) is configured to transmit a different transmission spectrum than the first, column 6, line 32 through column 7, line 4, see figure 3.), the electrical signal operable to activate the first layer and to activate the second layer (column 3, lines 60-65).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include first and second layers sensitive to different spectral bands as taught by Wagner in the electro-optical element taught by Daly for the benefit of creating a more dynamic filter configuration (Wagner, column 2, lines 61-63) in which an optimum color can be produced due to the variety of spectral responses obtained (Wagner, column 6, lines 60-65).

Consider **claim 3**, and as applied to claim 1 above, Daly teaches an electro-optical element for filtering and transmitting different spectral bands (84, figure 8, see claim 1 rationale).

However, Daly does not explicitly teach that the electro-optical element comprises different sections sensitive to different spectral bands. Wagner is very similar to Daly in that light is passed from a lens assembly (12, figure 1) through an electro-

optical filter arrangement (18, figure 1) to an image sensor (28 and 30, figure 1). See column 3, line 31 through column 7, line 4.

However, in addition to the teachings of Daly, Wagner teaches that the electro-optical element (18, figure 1, column 3, lines 32-36) comprises:

a first section (20, figure 1) sensitive to a first spectral band of the spectral bands (The first section(20) is tunable to transmit different spectral bands, column 5, line 5 through column 6, line 31. The spectral band transmitted is based on the applied voltage, column 5, lines 64-66. See also figure 2.); and

a second section (22, figure 1) sensitive to a second spectral band of the spectral bands (The second section (22) is configured to transmit a different transmission spectrum than the first, column 6, line 32 through column 7, line 4, see figure 3.), the electrical signal operable to activate the first layer and to activate the second layer (column 3, lines 60-65).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include first and second layers sensitive to different spectral bands as taught by Wagner in the electro-optical element taught by Daly for the benefit of creating a more dynamic filter configuration (Wagner, column 2, lines 61-63) in which an optimum color can be produced due to the variety of spectral responses obtained (Wagner, column 6, lines 60-65).

Consider **claim 8**, and as applied to claim 7 above, Daly teaches an electro-optical element for filtering and transmitting different spectral bands (84, figure 8, see claim 1 rationale).

However, Daly does not explicitly teach that the electro-optical element comprises different layers sensitive to different spectral bands.

Wagner is very similar to Daly in that light is passed from a lens assembly(12, figure 1) through an electro-optical filter arrangement (18, figure 1) to an image sensor (28 and 30, figure 1). See column 3, line 31 through column 7, line 4.

However, in addition to the teachings of Daly, Wagner teaches that the electro-optical element (18, figure 1, column 3, lines 32-36) comprises:

a first layer (20, figure 1) sensitive to a first spectral band of the spectral bands (The first layer (20) is tunable to transmit different spectral bands, column 5, line 5 through column 6, line 31. The spectral band transmitted is based on the applied voltage, column 5, lines 64-66. See also figure 2.); and

a second layer (22, figure 1) sensitive to a second spectral band of the spectral bands (The second layer (22) is configured to transmit a different transmission spectrum than the first, column 6, line 32 through column 7, line 4, see figure 3.), the electrical signal operable to activate the first layer and to activate the second layer (column 3, lines 60-65).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include first and second layers sensitive to different spectral bands as taught by Wagner in the electro-optical element taught by Daly for the

benefit of creating a more dynamic filter configuration (Wagner, column 2, lines 61-63) in which an optimum color can be produced due to the variety of spectral responses obtained (Wagner, column 6, lines 60-65).

Consider **claim 9**, and as applied to claim 7 above, Daly teaches an electro-optical element for filtering and transmitting different spectral bands (84, figure 8, see claim 1 rationale).

However, Daly does not explicitly teach that the electro-optical element comprises different sections sensitive to different spectral bands.

Wagner is very similar to Daly in that light is passed from a lens assembly (12, figure 1) through an electro-optical filter arrangement (18, figure 1) to an image sensor (28 and 30, figure 1). See column 3, line 31 through column 7, line 4.

However, in addition to the teachings of Daly, Wagner teaches that the electro-optical element (18, figure 1, column 3, lines 32-36) comprises:

a first section (20, figure 1) sensitive to a first spectral band of the spectral bands (The first section (20) is tunable to transmit different spectral bands, column 5, line 5 through column 6, line 31. The spectral band transmitted is based on the applied voltage, column 5, lines 64-66. See also figure 2.); and

a second section (22, figure 1) sensitive to a second spectral band of the spectral bands (The second section (22) is configured to transmit a different transmission spectrum than the first, column 6, line 32 through column 7, line 4, see figure 3.), the

electrical signal operable to activate the first layer and to activate the second layer (column 3, lines 60-65).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include first and second layers sensitive to different spectral bands as taught by Wagner in the electro-optical element taught by Daly for the benefit of creating a more dynamic filter configuration (Wagner, column 2, lines 61-63) in which an optimum color can be produced due to the variety of spectral responses obtained (Wagner, column 6, lines 60-65).

Consider **claim 14**, and as applied to claim 13 above, Daly teaches an electro-optical element for filtering and transmitting different spectral bands (84, figure 8, see claim 1 rationale).

However, Daly does not explicitly teach that the electro-optical element comprises different layers sensitive to different spectral bands.

Wagner is very similar to Daly in that light is passed from a lens assembly (12, figure 1) through an electro-optical filter arrangement (18, figure 1) to an image sensor (28 and 30, figure 1). See column 3, line 31 through column 7, line 4.

However, in addition to the teachings of Daly, Wagner teaches that the electro-optical element (18, figure 1, column 3, lines 32-36) comprises:

a first layer (20, figure 1) sensitive to a first spectral band of the spectral bands (The first layer (20) is tunable to transmit different spectral bands, column 5, line 5

through column 6, line 31. The spectral band transmitted is based on the applied voltage, column 5, lines 64-66. See also figure 2.); and

a second layer (22, figure 1) sensitive to a second spectral band of the spectral bands (The second layer (22) is configured to transmit a different transmission spectrum than the first, column 6, line 32 through column 7, line 4, see figure 3.), the electrical signal operable to activate the first layer and to activate the second layer (column 3, lines 60-65).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include first and second layers sensitive to different spectral bands as taught by Wagner in the electro-optical element taught Daly for the benefit of creating a more dynamic filter configuration (Wagner, column 2, lines 61-63) in which an optimum color can be produced due to the variety of spectral responses obtained (Wagner, column 6, lines 60-65).

Consider **claim 15**, and as applied to claim 13 above, Daly teaches an electro-optical element for filtering and transmitting different spectral bands (84, figure 8, see claim 1 rationale).

However, Daly does not explicitly teach that the electro-optical element comprises different sections sensitive to different spectral bands.

Wagner is very similar to Daly in that light is passed from a lens assembly (12, figure 1) through an electro-optical filter arrangement (18, figure 1) to an image sensor (28 and 30, figure 1). See column 3, line 31 through column 7, line 4.

However, in addition to the teachings of Daly, Wagner teaches that the electro-optical element (18, figure 1, column 3, lines 32-36) comprises:

a first section (20, figure 1) sensitive to a first spectral band of the spectral bands (The first section (20) is tunable to transmit different spectral bands, column 5, line 5 through column 6, line 31. The spectral band transmitted is based on the applied voltage, column 5, lines 64-66. See also figure 2.); and

a second section (22, figure 1) sensitive to a second spectral band of the spectral bands (The second section (22) is configured to transmit a different transmission spectrum than the first, column 6, line 32 through column 7, line 4, see figure 3.), the electrical signal operable to activate the first layer and to activate the second layer (column 3, lines 60-65).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include first and second layers sensitive to different spectral bands as taught by Wagner in the electro-optical element taught by Daly for the benefit of creating a more dynamic filter configuration (Wagner, column 2, lines 61-63) in which an optimum color can be produced due to the variety of spectral responses obtained (Wagner, column 6, lines 60-65).

Claims 6, 12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daly in view of Handschy et al. (U.S. Patent 5,347,378).

Consider **claim 6**, and as applied to claim 1 above, Daly further teaches:

Receiving the composite signa l(The composite signal is received by the color reproduction processor (120), column 11, line 57 through column 12, line 5, see figure 8.), the composite signal associated with a plurality of display spectral bands (The composite signal is associated with the Y, U, and V bands combined in the field-to-frame combiner (118), column 11, line 42 through column 12, line 5.). Daly further teaches that the color signal produced is transmitted to different devices, column 12, lines 3-5.

However, Daly does not explicitly teach that the display electrical signal for each of the bands is sent to a display electro-optical element;

changing an optical property of the display electro-optical element in response to the display electrical signal to filter for a display spectral band; and

transmitting the display spectral band to a display; and

displaying the display spectral bands at the display to generate the image.

Handschy et al. are similar to Daly in that Handschy et al. teach of generating a frame comprising three different color bands (column 17, lines 1-59, figure 6(a)). Handschy et al. also similarly teach that current invention pertains to frame sequential color video systems (column 1, lines 17-37).

However, in addition to the teachings of Daly, Handschy et al. teach of receiving bands sent to a display electro-optical element (100, 200, 300, figure 1, column 6, line 16 through column 7, line 4), changing an optical property of the display electro-optical element (100, 200, 300) in response to the display electrical signal to filter for a display spectral band (column 6, lines 21-33, lines 44-46), transmitting the display spectral band

to a display (The electro-optical element (100, 200, 300) is part of the display, see figure 1.), and displaying the display spectral bands at the display to generate the image (Each display spectral band is displayed for one third of the time, and the three display spectral bands combine to generate an image. Column 16, lines 50-61, column 17, lines 39-45).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to transmit the composite signal as taught by Daly to a display containing an electro-optical element as taught by Handschy et al. for the benefit of offering a superior performance display with fewer elements, low cost, and a simple structure (Handschy et al., column 5, lines 48-52, column 4, lines 27-32).

Consider **claim 12**, and as applied to claim 7 above Daly further teaches:

Receiving the composite signal (The composite signal is received by the color reproduction processor (120), column 11, line 57 through column 12, line 5, see figure 8.), the composite signal associated with a plurality of display spectral bands (The composite signal is associated with the Y, U, and V bands combined in the field-to-frame combiner (118), column 11, line 42 through column 12, line 5.). Daly further teaches that the color signal produced is transmitted to different devices, column 12, lines 3-5.

However, Daly does not explicitly teach that the display electrical signal for each of the bands is sent to a display electro-optical element;

changing an optical property of the display electro-optical element in response to the display electrical signal to filter for a display spectral band; and

transmitting the display spectral band to a display; and

displaying the display spectral bands at the display to generate the image.

Handschy et al. are similar to Daly in that Handschy et al. teach of generating a frame comprising three different color bands (column 17, lines 1-59, figure 6(a)). Handschy et al. also similarly teach that current invention pertains to frame sequential color video systems (column 1, lines 17-37).

However, in addition to the teachings of Daly, Handschy et al. teach of receiving bands sent to a display electro-optical element (100, 200, 300, figure 1, column 6, line 16 through column 7, line 4), changing an optical property of the display electro-optical element (100, 200, 300) in response to the display electrical signal to filter for a display spectral band (column 6, lines 21-33, lines 44-46), transmitting the display spectral band to a display (The electro-optical element (100, 200, 300) is part of the display, see figure 1.), and displaying the display spectral bands at the display to generate the image (Each display spectral band is displayed for one third of the time, and the three display spectral bands combine to generate an image. Column 16, lines 50-61, column 17, lines 39-45).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to transmit the composite signal as taught by Daly to a display containing an electro-optical element as taught by Handschy et al. for the benefit

of offering a superior performance display with fewer elements, low cost, and a simple structure (Handschy et al., column 5, lines 48-52, column 4, lines 27-32).

Consider **claim 18**, and as applied to claim 13 above Daly further teaches:

Receiving the composite signal (The composite signal is received by the color reproduction processor (120), column 11, line 57 through column 12, line 5, see figure 8.), the composite signal associated with a plurality of display spectral bands (The composite signal is associated with the Y, U, and V bands combined in the field-to-frame combiner (118), column 11, line 42 through column 12, line 5.). Daly further teaches that the color signal produced istransmitted to different devices, column 12, lines 3-5.

However, Daly does not explicitly teach that the display electrical signal for each of the bands is sent to a display electro-optical element;

changing an optical property of the display electro-optical element in response to the display electrical signal to filter for a display spectral band; and

transmitting the display spectral band to a display; and

displaying the display spectral bands at the display to generate the image.

Handschy et al. are similar to Daly in that Handschy et al. teach of generating a frame comprising three different color bands (column 17, lines 1-59, figure 6(a)). Handschy et al. also similarly teach that current invention pertains to frame sequential color video systems (column 1, lines 17-37).

However, in addition to the teachings of Daly, Handschy et al. teach of receiving bands sent to a display electro-optical element (100, 200, 300, figure 1, column 6, line 16 through column 7, line 4), changing an optical property of the display electro-optical element (100, 200, 300) in response to the display electrical signal to filter for a display spectral band (column 6, lines 21-33, lines 44-46), transmitting the display spectral band to a display (The electro-optical element (100, 200, 300) is part of the display, see figure 1.), and displaying the display spectral bands at the display to generate the image (Each display spectral band is displayed for one third of the time, and the three display spectral bands combine to generate an image. Column 16, lines 50-61, column 17, lines 39-45).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to transmit the composite signal as taught by Daly to a display containing an electro-optical element as taught by Handschy et al. for the benefit of offering a superior performance display with fewer elements, low cost, and a simple structure (Handschy et al., column 5, lines 48-52, column 4, lines 27-32).

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daly in view of Wagner, and further in view of Handschy et al.

Consider **claim 20**, Daly teaches:

A method for generating an image (paragraphs 0042-0045, figure 8), comprising:

Receiving light associated with a plurality of spectral bands (A scene (i.e, light associated with a plurality of spectral bands, 82, figure 8) is captured via optics (82) and passed to a color filter (84), column 11, lines 26-27.);

Repeating the following for each spectral band associated with the light: receiving an electrical signal at an electro-optical element (An electro-optical element ("active color filter", 84, figure 8) receives an electric signal from a field control clock (86), column 11, lines 25-35.);

changing an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band (The spectral transmission (i.e, an optical property) of the electro-optical element (84) is changed in response to the signal from the field control clock (86), column 11, lines 25-35. The electro-optical component (84) creates a color component set (i.e, filters for different spectral bands) including B, Y, and R color components, column 11, lines 35-47.); and

transmitting the spectral band to a sensor (See "area sensor", 90, figure 8, column 11, lines 35-37. The filtered scene impinges a monochrome area sensor (90).);

sensing the spectral bands at the sensor (See "area sensor", 90, figure 8, column 11, lines 35-37. The area sensor (90) nominally detects and captures the three color fields (i.e. three spectral bands).), the sensor(90) is synchronized with the electro-optical element(84), the sensor(90) being operable to sense a spectral band when the spectral band arrives at the sensor from the electro- optical element (The sensor(90) and electro-optical element(84) are synchronized by both being connected to the color field control clock(86). See figure 8, column 11, paragraph 0042.);

combining the spectral bands to generate the composite signal (The spectral bands are combined by the field to frame combiner (118), figure 8, column 11, line 57 through column 12, line 1.) by accessing a function of the spectral bands (The spectral bands are passed through filters (106, 108, 110, 112, 114, and 116, figure 8) to produce noise free images (i.e. a function, or noise free version, of the spectral bands is obtained), column 11 lines 49-58. The noise free images (i.e. functions of the original images) are provided to (i.e. accessed by) the field-to-frame combiner (118), column 11, line 57 through column 12, line 5.), and by multiplexing the spectral bands in accordance with the function to combine the spectral bands (Each spectral band is subjected to filtering prior to being input into the field-to-frame combiner (figure 8, column 11, lines 49-57). Because all of the spectral bands are filtered, and the functions of all of the spectral bands are input into the field-to-frame combiner (See figure 8), the field-to-frame combiner accesses a function of the spectral bands, and not just a spectral band. Daly, therefore, teaches accessing a function of the spectral bands (i.e. a noise reduced group of spectral bands) and multiplexing the spectral bands in accordance with the function (The noise reduced spectral bands are combined in the field-to-frame combiner (118), column 11, line 57 through column 12 line 3. The examiner interprets this combining to be multiplexing, as the data of three separate field images is combined to create a single image frame containing all of said data, an intrinsic function of a field-to-frame combiner.).),

said function causing said spectral bands to be combined using at least one of: adding (Daly teaches that the different spectral bands (i.e. fields) are combined to

create a frame in a field to frame combiner (118, figure 8, column 11, line 57 through column 12, line 1). The Examiner interprets this combining to be adding individual fields in order to create a frame. Basically, three fields are added into one frame. Thus, the spectral bands are combined using at least one of: adding. The function causes this by virtue of its input into the field to frame combiner, figure 8.); and

generating an image from the composite signal (A color reproduction processor (120) generates an image based on the composite signal, column 11, line 57 through column 12, line 5, column 8 lines 4-5 and lines 15-17.) by:

receiving the composite signal (The composite signal is received by the color reproduction processor (120), column 11, line 57 through column 12, line 5, see figure 8.), the composite signal associated with a plurality of display spectral bands (The composite signal is associated with the Y, U, and V bands combined in the field-to-frame combiner (118), column 11, line 42 through column 12, line 5). Daly further teaches that the color signal produced is transmitted to different devices, column 12, lines 3-5.

However, Daly does not explicitly teach that the electro-optical element has different layers sensitive to different spectral bands, or different sections sensitive to different spectral bands.

Wagner is very similar to Daly in that light is passed from a lens assembly (12, figure 1) through an electro-optical filter arrangement (18, figure 1) to an image sensor (28 and 30, figure 1). See column 3, line 31 through column 7, line 4.

However, in addition to the teachings of Daly, Wagner teaches that the electro-optical element (18, figure 1, column 3, lines 32-36) comprises:

a first layer (20, figure 1) sensitive to a first spectral band of the spectral bands (The first layer (20) is tunable to transmit different spectral bands, column 5, line 5 through column 6, line 31. The spectral band transmitted is based on the applied voltage, column 5, lines 64-66. See also figure 2.); and

a second layer (22, figure 1) sensitive to a second spectral band of the spectral bands (The second layer (22) is configured to transmit a different transmission spectrum than the first, column 6, line 32 through column 7, line 4, see figure 3.), the electrical signal operable to activate the first layer and to activate the second layer (column 3, lines 60-65).

Wagner also teaches that the electro-optical element (18, figure 1, column 3, lines 32-36) comprises:

a first section (20, figure 1) sensitive to a first spectral band of the spectral bands (The first section (20) is tunable to transmit different spectral bands, column 5, line 5 through column 6, line 31. The spectral band transmitted is based on the applied voltage, column 5, lines 64-66. See also figure 2.); and

a second section (22, figure 1) sensitive to a second spectral band of the spectral bands (The second section (22) is configured to transmit a different transmission spectrum than the first, column 6, line 32 through column 7, line 4, see figure 3.), the electrical signal operable to activate the first layer and to activate the second layer (column 3, lines 60-65).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include first and second layers sensitive to different spectral bands as taught by Wagner in the electro-optical element taught by Daly for the benefit of creating a more dynamic filter configuration (Wagner, column 2, lines 61-63) in which an optimum color can be produced due to the variety of spectral responses obtained (Wagner, column 6, lines 60-65).

However, the combination of Daly and Wagner does not explicitly teach that the display electrical signal for each of the bands is sent to a display electro-optical element;

changing an optical property of the display electro-optical element in response to the display electrical signal to filter for a display spectral band; and

transmitting the display spectral band to a display; and

displaying the display spectral bands at the display to generate the image.

Handschy et al. are similar to Daly in that Handschy et al. teach of generating a frame comprising three different color bands (column 17, lines 1-59, figure 6(a)). Handschy et al. also similarly teach that current invention pertains to frame sequential color video systems (column 1, lines 17-37).

However, in addition to the teachings of the combination of Daly and Wagner, Handschy et al. teach of receiving bands sent to a display electro-optical element (100, 200, 300, figure 1, column 6, line 16 through column 7, line 4), changing an optical property of the display electro-optical element (100, 200, 300) in response to the display electrical signal to filter for a display spectral band (column 6, lines 21-33, lines 44-46),

transmitting the display spectral band to a display (The electro-optical element(100, 200, 300) is part of the display, see figure 1.), and displaying the display spectral bands at the display to generate the image (Each display spectral band is displayed for one third of the time, and the three display spectral bands combine to generate an image. Column 16, lines 50-61, column 17, lines 39-45).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to transmit the composite signal as taught by the combination of Daly and Wagner to a display containing an electro-optical element as taught by Handschy et al. for the benefit of offering a superior performance display with fewer elements, low cost, and a simple structure (Handschy et al., column 5, lines 48-52, column 4, lines 27-32).

(10) Response to Argument

Applicant argues, with respect independent claims 1, 7, 13, 19 and 20, that Daly does not teach every element of the claims in as much detail as is contained in the claims. For instance, claim 1 recites, in part, "said function causing said spectral bands to be combined using at least one of: adding and weighted combining." Daly does not teach this feature of claim 1. For a 35 U.S.C. § 102 rejection to be proper, the reference must teach the invention in as much detail as is contained in the claim. M.P.E.P. § 2131 (citing Richardson, 9 U.S.P.Q.2d at 1920). Claim 1 not only recites combining, but it also goes into an additional level of detail by reciting at least two possible techniques to perform combining (adding and weighted combining). Daly, on the other hand,

merely discloses combining and does not disclose any particular technique for combining by the field to frame combiner 118 of Figure 8. Daly just simply does not teach combining spectral bands using adding (or weighting combining), and, try as it may, the rejection cannot fill in the gap in Daly. For at least this reason, Daly fails to teach the above-recited feature of claim 1.

The examiner respectfully disagrees. Claim 1 recites “causing said spectral bands to be combined using **at least one of: adding and weighted combining**”. Claim 1 does not provide any further detail as to what the adding or weighted combining entails. The examiner has concluded that Daly does indeed teach said function causing said spectral bands to be combined uses at least one of: adding and weighting combining. Daly teaches that the different spectral bands (i.e. fields) are combined to create a frame in a field to frame combiner (118, figure 8, column 11, line 57 through column 12, line 1). The examiner interprets this combining to be adding individual fields in order to create a composite frame. Thus, the spectral bands are combined using at least one of: adding. The examiner disagrees that this interpretation reads more into Daly that what Daly discloses. Daly teaches combining three separate fields to create one frame (i.e. that three separate fields are added into a frame). Basically, the data of three separate field images is combined to create a single image frame containing the data of all three fields. This does not imply that the three fields are added to each other, but rather simply that they are added into a frame. Without any further indication about what said "adding" entails, the examiner interprets claim 1 such that the spectral bands are either (1) combined by adding the fields to a frame without weighting the fields, or

(2) weighting the fields during the combining to create the frame, of which Daly at least teaches (1).

Applicant additionally argues that the rejection still asserts that Daly's combining fields into a frame includes adding the fields. Such assertion is improper. Daly does not teach that combining fields into a frame includes adding fields. Furthermore, the rejection does not explain how it comes to the conclusion that Daly's combining is additive, as opposed to being based upon some other transform. The rejection provides no more than speculation and assumption regarding Daly's undescribed combining algorithm, and speculation and assumption do not support anticipation under 35 U.S.C. § 102.

The examiner respectfully disagrees. The examiner stated above, and also in the previous rejection that “three separate fields are added into a frame”, and further that “This does not imply that the three fields are added to each other, but rather simply that they are added into a frame”. Basically, the data of three separate field images is combined to create a single image frame containing the data of all three fields. The Examiner is in no way asserting that Daly teaches that the three fields are added to each other, but rather that the three fields are added to a single frame.

Furthermore, claim 1 recites "causing said spectral bands to be combined using **at least one of: adding and weighted combining**”. The examiner believes that Daly satisfies this claim limitation by teaching “at least one of: adding" (see claim 1 rationale above). However, Daly also teaches that the three spectral bands (i.e. fields) are combined "and processed according to protocols of color reproduction and format by a

color reproduction processor 120", column 11, line 57 through column 12, line 3. Daly teaches "specific scaling and offsets to make the U and V signals compatible is applied in the color reproductions mechanism/step of Fig. 8", column 14, lines 5-8. Therefore, as the U and V fields (i.e. spectral bands) are scaled and offset (i.e. weighted), Daly further teaches causing said spectral bands to be combined using at least one of: weighted combining.

For the above reasons, it is believed that the rejections should be sustained.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Respectfully submitted,

Albert Cutler

Conferees:

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